

ART. 17.—*A Monograph of the Psocoptera, or Copeognatha, of New Zealand.*

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[Read before the Nelson Institute, 16th June, 1921; received by Editor, 20th June, 1921; issued separately, 17th February, 1923.]

Plate 18.

INTRODUCTION.

THE Psocoptera, or Copeognatha, are a somewhat small but remarkably distinct and well-defined order of insects, having no very close affinities with any other group. With the exception of a single family of comparatively large forms, the Thyrsophoridae, confined to South America, the order contains only small insects, ranging from little more than 1 mm. long (wingless forms) to forms having an expanse of wing up to about $\frac{1}{2}$ in. They are for the most part beneficial insects, feeding upon fungi, lichens, and algae, though some gnaw the outer bark of trees, and two genera at least have become world-wide pests of houses—the notorious “book-lice” (*Troctes* and *Atropos*).

Morphologically, the order is distinguished by some remarkable characters in the form of the head, mouth-parts, thorax, and wings. These may be briefly discussed here.

In the head, the epicranium (or vertex) is divided into two parts by a longitudinal suture—a primitive character not to be found in any other order of winged insects. A wide V-shaped suture divides the epicranium from the frons. The three ocelli, when present (as they usually are), lie close in at the three angles formed by the meeting of this frontal suture with the median vertical suture. The median ocellus lies on the frons, in the angle of the V, while the two lateral ocelli lie on the epicranium, one on each side of the median vertical suture. The clypeus is high and very convex, almost bulbous, and generally striated in a complicated manner; below it there is a smaller piece, lying above the labrum, which is called the “clypeolus.” It will be clear that the clypeus really corresponds with the postclypeus of the Odonata, while the clypeolus corresponds with the anteclypeus of that order.

In the mouth-parts, the mandibles are interesting because of their distinct asymmetry, the teeth of one fitting into the clefts between those of the other. Each mandible carries, besides teeth, a corrugated grinding or chewing plate; and these also are of different shape in right and left mandibles. The maxillae are divided into two very distinct parts by means of the separation of a long maxillary chisel, supposed to represent the lacinia. This remarkable organ, which is without parallel in the Insecta, and from which the name Copeognatha (“chisel-jawed”) is taken, is a long, hard rod, with a sharp and peculiarly-formed end, reminding one of some of the more complex of a set of carving-chisels. These chisels can be extruded from the mouth to a considerable distance, and are used

by the insects to cut away pieces of the mycelia of fungi, or to gouge out small portions of the bark of trees. The rest of the maxilla is not remarkable, the galea being normal and the palp four-jointed. The hypopharynx is trilobed. The labium is very short, with paired inner lobes and single-jointed palps.

As regards the thorax, the prothorax is small and very little developed in most of the winged forms, though it may be of comparatively large size in some of the small wingless forms. The mesothorax is nearly always the largest segment. The mesonotum is divided by sutures into a triangular anteriorly-placed piece, called the "antedorsum," a large middle piece, called the "dorsum," divided into two parts by a median longitudinal suture, and a posteriorly-placed post-dorsum, which carries the scutellum in its middle, and two narrow crests laterally, known as the "cristae scutelli." The metathorax is similar in structure to the mesothorax, but much smaller.

The legs show little specialization. The tibia usually carries one or two very small apical movable spurs. The tarsi are either two- or three-jointed, the basal joint often carrying a complex comb (text-figs. 2, *b*, *c*, ; 13, *b*), while the distal joint ends in two claws and an empodium.

The wings are held in a roof-like manner over the body. Because of the general shape of the insect, its appearance, viewed from above when the wings are closed, offers a suggestion of the shape of a porpoise. Hence the generic name *Psocus* (Gr. = a porpoise), from which the ordinal name Psocoptera is derived. The forewings are always larger and more completely veined than the hind. The type of venation is quite unique amongst insects, permitting an insect of this order to be recognized at first sight by the venational scheme alone. In many cases the whole of the venation is formed from the main veins, and in no case are there present more than one or two cross-veins at the most. The specializations present in the wing-venation are best understood by comparing the tracheation of the larval wing with the venation of the imago. For this purpose we must compare text-figs. 1 and 2, *a*. It will then be seen that, in the forewing, Sc and R run close together, usually completely fused, and only separating distally, Sc stopping short first, and forming the basal boundary of the pterostigma, while R_1 runs on, forming all of its posterior and distal boundaries. Normally the pterostigma is much enlarged distally, owing to the waviness of R_1 forming a distal convexity. Rs comes off from R near the middle of the wing, and often fuses at a point, or for a short distance, with M before passing on to divide into its two end branches, R_{2+3} and R_{4+5} . M descends from R close to the base, and at once fuses with Cu_1 very close to the point of origin of that vein from the main stem of Cu. This fusion continues nearly to the level of the origin of Rs, and then M and Cu_1 diverge sharply, the former running to touch or join Rs, while the latter descends obliquely towards the posterior wing-margin. Distally, M gives off normally three branches, very rarely four, five, or even eight. Cu_1 , just before reaching the margin, usually divides into two. Of these, the more basal branch, Cu_{1b} , is generally short, and runs directly to the margin. But the more distal, Cu_{1a} , arches up again away from the margin, and forms a more or less well-marked cubital loop, enclosing a special area known as the "areola postica." This loop sometimes becomes connected with M above it by a cross-vein, or it may actually itself touch M, or even fuse with it for a greater or less distance, in which case its distal portion will appear as if it were an extra branch of M.

The clavus, or anal area of the wing, is separated from the rest by the concave vein Cu_2 , which leaves the main stem of Cu near the base, and runs obliquely, and generally almost straight, to about the middle of the

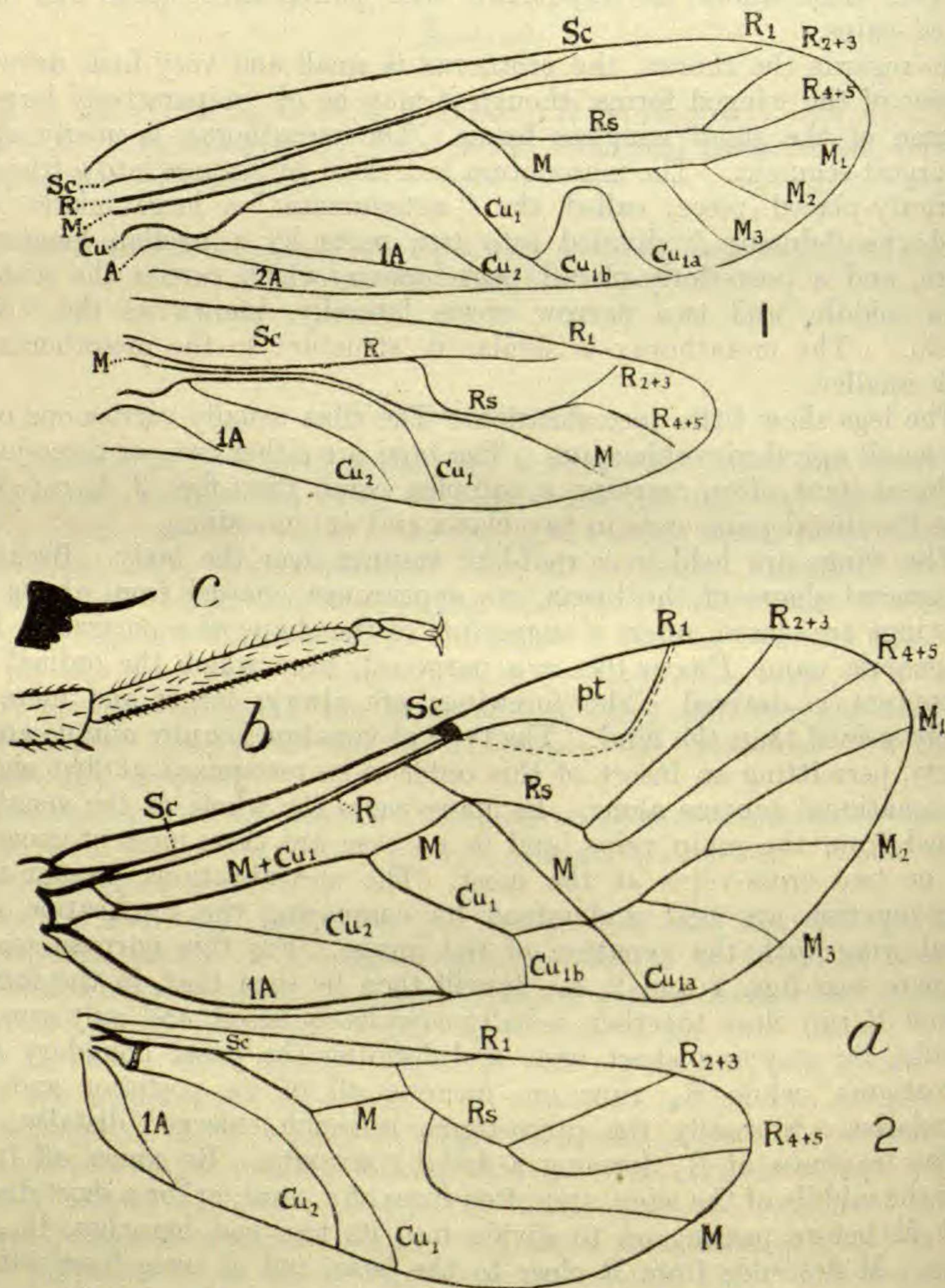


FIG. 1.—Tracheation of last larval instar in an undescribed Australian species of *Psocus*. $\times 54$. 1A, anal vein; Cu , cubitus; Cu_1 , its anterior branch, dividing into Cu_{1a} , and Cu_{1b} in forewing, the former making the *cubital loop*; Cu_2 , its posterior branch, bounding the *clavus* anteriorly; M , media; M_1 , M_2 , M_3 , M_4 , its branches; *pt*, pterostigma; R , radius; R_1 , its main stem, forming in forewing the posterior border of pterostigma; Rs , radial sector, dividing into R_{2+3} and R_{4+5} ; Sc , subcosta, its free end in forewing forming the basal side of the pterostigma.

FIG. 2.—*a*. Venation of *Myopsocus novae-zealandiae* Kolbe, σ ; $\times 24$. *b*. Three-jointed hind tarsus of same, showing the comb on the basal joint; $\times 24$. *c*. A single tooth from the same comb; $\times 232$.

posterior margin of the wing, thus cutting off the clavus as a rather narrow area with more or less sharp distal angle. Previous authors, in dealing with this vein, have called it 1A, following the mistake made by Comstock

and Needham. Having examined the tracheation of the wings in the last two instars of an Australian species of *Psocus*, I have been able to prove that this vein is from the very first a branch of Cu. This result brings the Psocoptera into line with all other insects, in which it is now known universally that the vena dividens, separating the clavus from the rest of the wing, is formed by Cu₂. The only anal vein in the Psocoptera is the strongly convex 1A, running more or less close to the wing-margin.

In the hindwing the venation is considerably simplified. Sc is absent or a mere remnant, and there is no true pterostigma. Rs has two branches, as in the forewing, but M remains usually unbranched, though it may possess two branches in a few very archaic types. Basally, R, M, and Cu₁ become united for a space, and more distally Rs and M again unite for a short distance. There is no cubital loop, Cu₁ remaining always unbranched and running obliquely to near the middle of the posterior margin. Cu₂ is unbranched, and 1A usually very short.

The question of the affinity of the Psocoptera with other orders scarcely concerns us here, but it may be mentioned that they appear to be most closely related to the newly discovered order Zoraptera, which again shows relationship with the Isoptera. In other directions the Psocoptera show certain affinities with the Thysanoptera, Hemiptera, and Hymenoptera. The two parasitic orders Mallophaga and Anoplura appear undoubtedly to have been derived from some ancient wingless Psocoid type similar to the Atropidae, and it is worthy of note that wingless Psocoptera are even known at the present day to live upon mammals.

Little is known of the life-histories of the Psocoptera. Their eggs are laid in flat masses of twenty or more together, on leaves or under bark, and are covered with a fine protective web, spun from the mouth of the insect in a manner similar to that of the lepidopterous caterpillar. The young resemble the imago, except for the absence of wings; they have always two-jointed tarsi. The number of instars is not large, probably four only, the wing-buds appearing at the second instar. In the last instar the size of the body may appear even greater than that of the imago; but it shrinks somewhat just before the metamorphosis, which is accomplished with ease and celerity.

CLASSIFICATION.

The order is usually divided into two suborders on the number of joints in the tarsi, as follows:—

Tarsi three-jointed in imago, two-jointed in larva	..	..	Suborder TRIMERA.
Tarsi two-jointed in both imago and larva	..	..	Suborder DIMERA.

For taxonomic purposes this is a very convenient division, and it will be adopted here. I wish, however, to state that it seems quite clear that this subdivision does not represent the original dichotomy of the order, but merely separates the three most highly specialized families from all the rest. The more archaic representatives of the order are so rare, and so little is known about them, that much more work remains to be done before we shall be in a position to offer a classification of the order which truly represents its main lines of evolution.

The Trimera contain seven families—the Amphientomidae, Lepidopsocidae, Psoquillidae, Atropidae, Troctidae, Mesopsocidae, and Myopsocidae. Of these, only five have so far been found in New Zealand—viz., the Lepidopsocidae, Atropidae, and Troctidae (introduced species only), Mesopsocidae, and Myopsocidae.

The Dimera contain only three families—the Caeciliidae, Psocidae, and Thyrsophoridae. Only the first of these three is known in New Zealand. It is worthy of remark that, though the Psocidae are the dominant family in the Northern Hemisphere, and are abundant in Australia, not a single introduced species of this family has so far been noted for New Zealand.

The only species at present recorded for New Zealand in the order Psocoptera is the large and handsome mottled brown species *Myopsocus novae-zealandiae* Kolbe, quite a conspicuous insect, and very common in some localities. The introduced “book-lice,” *Troctes divinatorius* (Müller) and *Atropos pulsatoria* (Linn.), are also, of course, exceedingly common in houses here as elsewhere, but there does not appear to be any published record of them for New Zealand. In the native bush small species of Psocoptera are by no means uncommon, and at least two native species have spread to orchards and gardens, where they may be found in great abundance, feeding upon fungoid growths. As a result of two or three months’ collecting in a few localities only I have been able to bring to light a considerable number of new species. Specimens have also been received from Messrs. H. Hamilton and J. G. Myers, of Wellington; W. G. Howes, of Dunedin; and A. Philpott, of Nelson (including some collected by him around Invercargill). To all of these gentlemen I offer my sincere thanks for their help, and I hope that the publication of this paper may stimulate collecting in this order, and help to bring to light many more new species which, I feel sure, must still exist in many parts of these Islands. I also desire to thank Mr. W. C. Davies, Curator of the Cawthron Institute, for the excellent photograph from which Plate 18 has been prepared, and Mr. Philpott, Assistant Entomologist, for arranging the types for that purpose.

In the keys which follow I propose to give only those families and genera found in New Zealand, with the addition of the family Psocidae, so that introduced species belonging to that family may be recognized if any happen to be discovered later on.

KEY TO THE FAMILIES OF PSOCOPTERA FOUND IN NEW ZEALAND, WITH THE ADDITION OF THE PSOCIDAE.

1	{ Tarsi three-jointed in imago, two-jointed in larva. Suborder TRIMERA	2
	{ Tarsi two-jointed in both imago and larva. Suborder DIMERA	6
2	{ Meso- and meta-thorax completely fused together; imago absolutely without wings	TROCTIDAE.
	{ Meso- and meta-thorax separate; imago only very rarely wingless	3
3	{ Imago wingless, or at most with only vestiges of forewings; prothorax strongly developed, larger than mesothorax	ATROPIDAE.
	{ Imago winged, prothorax much smaller than mesothorax	4
4	{ Wings with abnormal venation; Cu ₂ and 1A in forewing not ending up together; body and wings both scaly and hairy; antennae with more than 13 joints	LEPIDOPSOCIDAE.
	{ Wings with normal venation; Cu ₂ and 1A in forewing ending up together; no scales on body or wings; antennae with 13 joints	5
5	{ Cubital loop of forewing not touching M above it	MESOPSOCIDAE.
	{ Cubital loop of forewing either just touching M or fusing with M for a short distance	MYOPSOCIDAE.
	{ Cubital loop of forewing absent, or, if present, not touching or connected with M above it	CAECILIIDAE.
6	{ Cubital loop of forewing present, either joined to M above it by a cross-vein, or just touching M, or fused with M for a greater or less distance	PSOCIDAE

DESCRIPTIONS OF THE GENERA AND SPECIES FOUND IN NEW ZEALAND.

Family ATROPIDAE.

This family may at once be recognized by the vestigial condition of the wings, the forewings being mere flaps, of small size, and without any true venation, while the hindwings are entirely absent. In some species it would appear that the forewings also are either absent or else commonly shed or broken off (vide *Lepinotus*, infra). They may at once be distinguished from the Troctidae by the fact that the meso- and meta-thorax remain as distinct, freely movable segments, not fused together, and the tarsal claws are never furnished with internal teeth. The two genera here recorded as having been introduced into New Zealand may be distinguished as follows:—

Meso- and meta-thorax equally reduced to narrow rings, both smaller than prothorax; antennae with 15 to 17 joints; last joint of maxillary palp elongate-oval; eyes very prominent; forewings in the form of broad flaps, or sometimes absent; abdomen broad and well rounded *Lepinotus* Heyd.

Metathorax longer and wider than both prothorax and mesothorax; antennae with 26 or more joints; last joint of maxillary palp hatchet-shaped; forewings in the form of somewhat narrower flaps; abdomen oval, much longer than wide *Atropos* Leach.

Genus ATROPOS Leach (= *Clothilla* Westwood).

Characters as given in the key above.

Genotype.—*Atropos pulsatoria* (Müller).

***Atropos pulsatoria* (Müller).** Lesser death-watch; book-louse; book-tick.
(Text-fig. 3.)

Though common throughout New Zealand, this insect has never yet been recorded as occurring here. It was probably introduced from England during the early days of settlement. As this insect is frequently confused with *Troctes divinatorius* (Linn.), the other common book-tick, a figure of it is given here. In size it may reach up to 2 mm. in length. The head is large, with the epicranial, frontal, and clypeal sutures well marked. The compound eyes are large, but ocelli are absent. The antennae have 26 or more joints, of which the first two are stouter than the rest. The maxillary palpi are four-jointed, the second being the longest, and the fourth (or distal) joint somewhat flattened and hatchet-shaped. The prothorax is broader and stronger than the mesothorax, the latter being a mere ring from the sides of which the vestigial forewings are developed; these project backwards and are very hairy. The meta-thorax is much longer, but there are no vestiges of the hindwings. In the legs, the femora are very stoutly built, the tibiae long and slender, the tarsi three-jointed, the basal joint being longer than the other two combined; the claws are well developed, but the empodium very small; each claw carries at its base a strong tenent hair, as long as the claw itself, and notched near its tip. The abdomen is elongate-oval, with distinct but narrow lateral ridges on segments 2-7. Colour testaceous, the abdomen rather prettily marked with regularly arranged brown spots, as shown in the figure. The abdomen is much less hairy than in the next succeeding species.

Genus LEPINOTUS Heyd.

Characters as given in the key above.

Genotype.—*Lepinotus inquilinus* Heyd.

Lepinotus inquilinus Heyd. (Text-fig. 4.)

This species is fairly common throughout New Zealand, and does a considerable amount of damage to books, paper, museum specimens, &c. It is here shown. Mature specimens vary in size from 1 mm. to 1.5 mm. in length, and may be either pale brown, dark brown, or almost black in

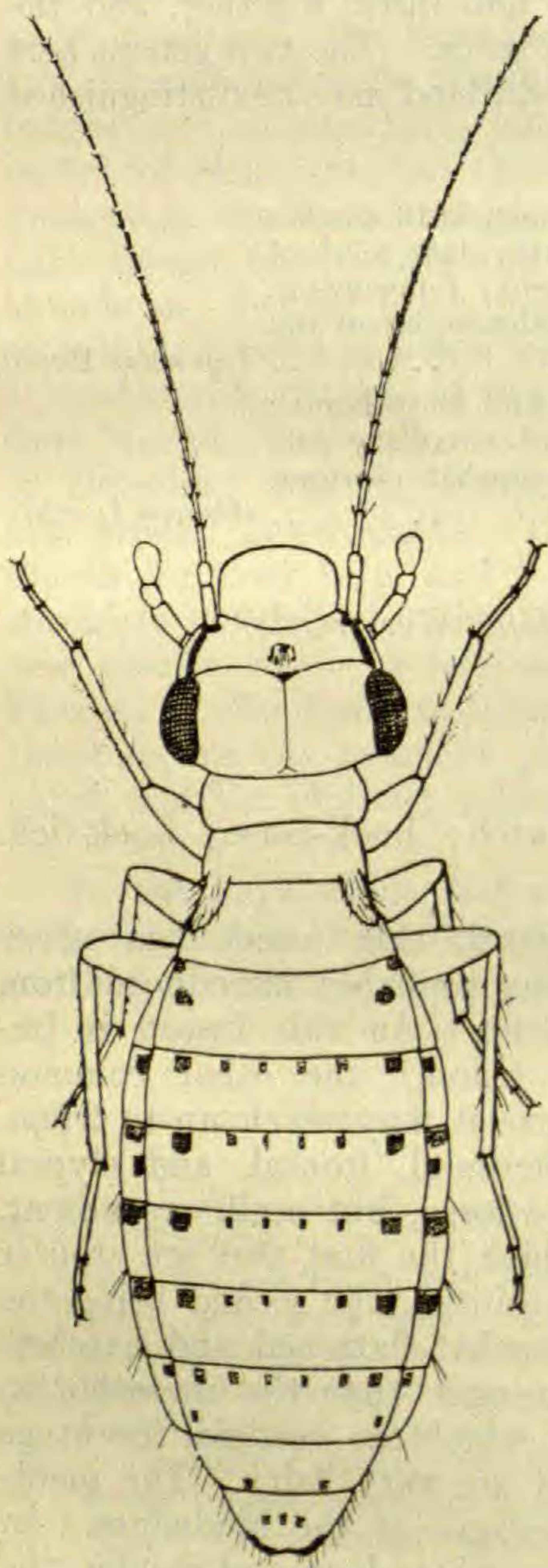


FIG. 3.—*Atropos pulsatoria* (Müller).
Nelson, N.Z. $\times 40$.

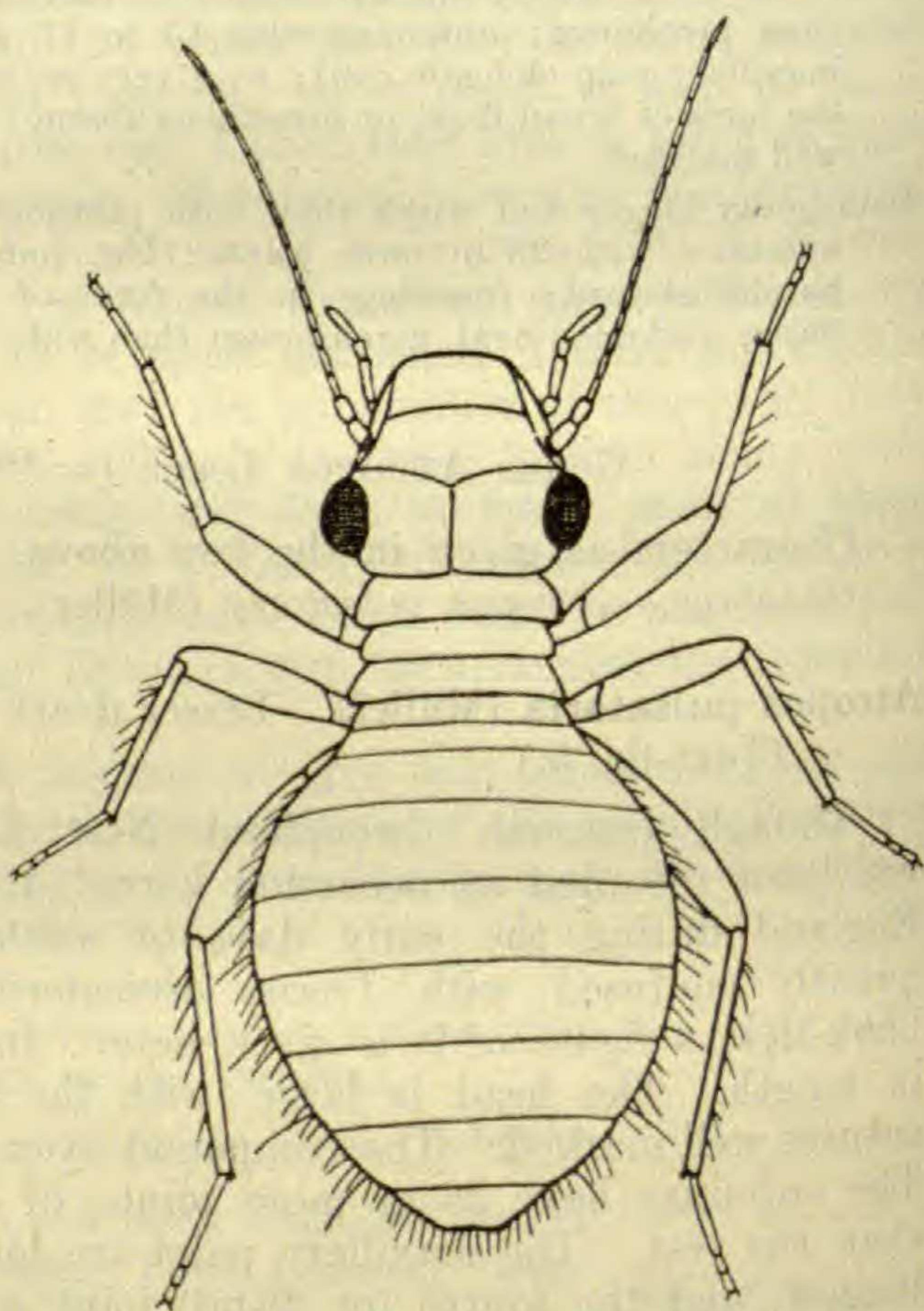


FIG. 4.—*Lepinotus inquilinus* Heyd.
Wingless form. Nelson, N.Z. $\times 40$.

colour. The head-sutures are fairly distinctly marked. The compound eyes are large and prominent, but there are no ocelli. The antennae consist of from 15 to 17 joints, of which the first two are stouter than the rest. Maxillary palpi four-jointed, the second joint a little longer than the distal one, which is elongate-oval in shape. The prothorax is well

developed, with slightly projecting lateral lobes. Meso- and meta-thorax are equally reduced to two mere rings; forewings either quite absent (possibly broken off) or present as short, broad, hairy flaps of a dark colour. The legs have stout and fairly long femora, long slender tibiae, and three-jointed tarsi, the basal joint being much longer than the other two combined. The claws are well developed, the empodia larger than in *Atropos*, but the tenent hairs weaker and shorter. The abdomen is broadly rounded, in mature females nearly as broad as long; the divisions between the segments are not quite as clearly marked as in *Atropos*. There is no colour-pattern, but an abundance of soft, delicate hairs.

The specimen figured is fully grown, but without wings. Specimens with the forewings present are, as far as my experience goes, less commonly found.

Family TROCTIDAE.

This family can at once be distinguished from all other families of the order by the complete fusion of the meso- and meta-thorax, so that the thorax at first sight appears to possess only two segments. It contains only very small, entirely wingless species. The tarsal claws carry an internal tooth before the apex.

Genus TROCTES Burm.

In addition to the family characters, this genus has the head rounded, with very small eyes; the last joint of the maxillary palp is elongate-oval; the abdomen is rather long and narrow, well rounded behind, with segments 9 and 10 completely fused together.

Genotype: *Troctes divinatorius* (Linn.).

***Troctes divinatorius* (Linn.).** Small book-louse; book-tick; cabinet-mite.

This species appears to be abundant everywhere in New Zealand, and is probably responsible for more damage in the aggregate to books, papers, museum specimens, &c., than the two larger species of *Atropidae* put together. As it is so well known, I have not figured it, but will point out that it can at once be recognized, under a moderate power of the microscope, by the family character of the fusion of the meso- and meta-thorax. In the general shape of the head, the form of the maxillary palpi, and the number of joints in the antennae it bears a general resemblance to *Lepinotus*, but can at once be distinguished from the latter by the more rounded head and the very small eyes. The abdomen is not broadly rounded as in *Lepinotus*, being much narrower, more like that of *Atropos* in shape, but much more rounded posteriorly. A microscopic examination of the tarsal claws will reveal the presence of the small tooth placed internally before the apex; this tooth is absent in all *Atropidae*. A further character is the armature of the hind femora, along their outer edge, with minute blunt teeth.

This species is considerably smaller than either of the two preceding ones, mature individuals measuring only 1 mm. long or a little over. They are mostly of a pale-testaceous colour, not unlike that of *Atropos pulsatoria*, but without any pattern whatever. Specimens can be obtained at almost any time of the year, simply by leaving some torn pieces of paper, dead leaves, sweepings, or other debris in a wooden box or a tin for a few weeks.

Family LEPIDOPSOCIDAE.

Antennae with considerably more than 13 joints. Maxillary palpi with the distal joint hatchet-shaped. Ocelli present, widely separated from one another. Body and wings both hairy and scaly, the scales pointed. Wings more or less pointed, the venation not of the normal Psocoid type; forewing with Cu_2 and 1A not ending together.

This family may be conveniently divided into two subfamilies, according to the following key:—

Antennae with 20–25 joints; hindwings with a very narrow closed cell; scales symmetrical	Subfamily PERIENTOMINAE.
Antennae with 26–47 joints; hindwings without a closed cell; scales asymmetrical	Subfamily LEPIDOPSOCINAE.

Only the latter subfamily is known in New Zealand.

Subfamily LEPIDOPSOCINAE.

Genus OXYPSOCUS n. g.

Head very hairy; thorax and abdomen carrying both hairs and scales. Antennae with about 28 joints, the first two swollen, the rest slender and slightly swollen at bases and tips. Maxillary palpi hairy. Wings sharply pointed, with a fringe of long hairs, especially long on posterior border of hindwing. Forewing excessively hairy and also scaly, the scales long and cultriform in shape. Hindwing without scales, and with few hairs except those forming the fringe. Venation very complete, Rs having two branches in each wing, M with three branches in fore and two in hind. In the forewing the costal border up to the pterostigma is strongly chitinized, and carries abundant scales and hairs. Pterostigma triangular, the free end of Sc, forming its basal side, being of considerable length. There is a narrow cell in basal third of forewing, closed distally by a small basal piece of Rs descending from R and fusing with M. Cu_1 leaves $M + Cu_1$ at about two-thirds along posterior side of this cell, and soon afterwards divides dichotomously into Cu_{1a} and Cu_{1b} . Cu_2 is a straight vein, weakly formed basally. 1A runs below it slightly divergingly, so that these two veins end up a considerable distance apart. Anal angle of clavus well marked, obtuse. In the hindwing all the veins except only Cu_2 and 1A are fused together basally. From this main stem Sc comes off very close to the base, and runs slantingly to end up at about one-third along the costal border. R_1 comes off at about one-third of the wing-length, and Cu_1 , which is unbranched, just before it. M_3 and M_{1+2} come off close to half-way and Rs divides somewhat beyond half-way into R_{2+3} and R_{4+5} , of which the latter runs to the apex. Cu_2 and 1A arise close together, but diverge considerably.

Genotype.—*Oxypsocus hamiltoni* n. sp. (New Zealand).

This genus is evidently a very archaic one, and appears to have its closest relative in *Echmepteryx* Aaron, from which it differs in the much more pointed wings, in the presence of a definite Sc in both wings, in the strongly chitinized costal area, in the much shorter and narrower closed cell of the forewing, and in the longer and narrower apical forkings of the veins. In its sharply pointed wings it resembles *Echinopsocus* End., but this latter genus has a very reduced venation and no closed cell in the forewing.

Oxypsocus hamiltoni n. sp. (Plate 18, fig. 1; text-figs. 5, 6.)

Forewing, 3 mm.; expanse of wings, 6.8 mm.

Head covered with golden-brown hairs and with a smaller number of black ones. Epicranium light brown, with two large squarish patches of dark brown between eyes, and three smaller patches covering the ocelli, which are black. Eyes and frons mottled with light and dark brown. Antennae brown, a pale ring on second joint; each joint from the third outwards with a whorl of several stiff hairs as long as the joint itself; the total number of joints is about 28. Clypeus very dark brown. Labrum pale brown in centre, bordered with dark brown.

Maxillary palpi medium brown.

Thorax dark shining brown with golden-brown hairs and darker scales. Legs dark brown banded with pale brown; tibiae with long stiff hairs.

Abdomen dark brown with paler brown hairs and scales.

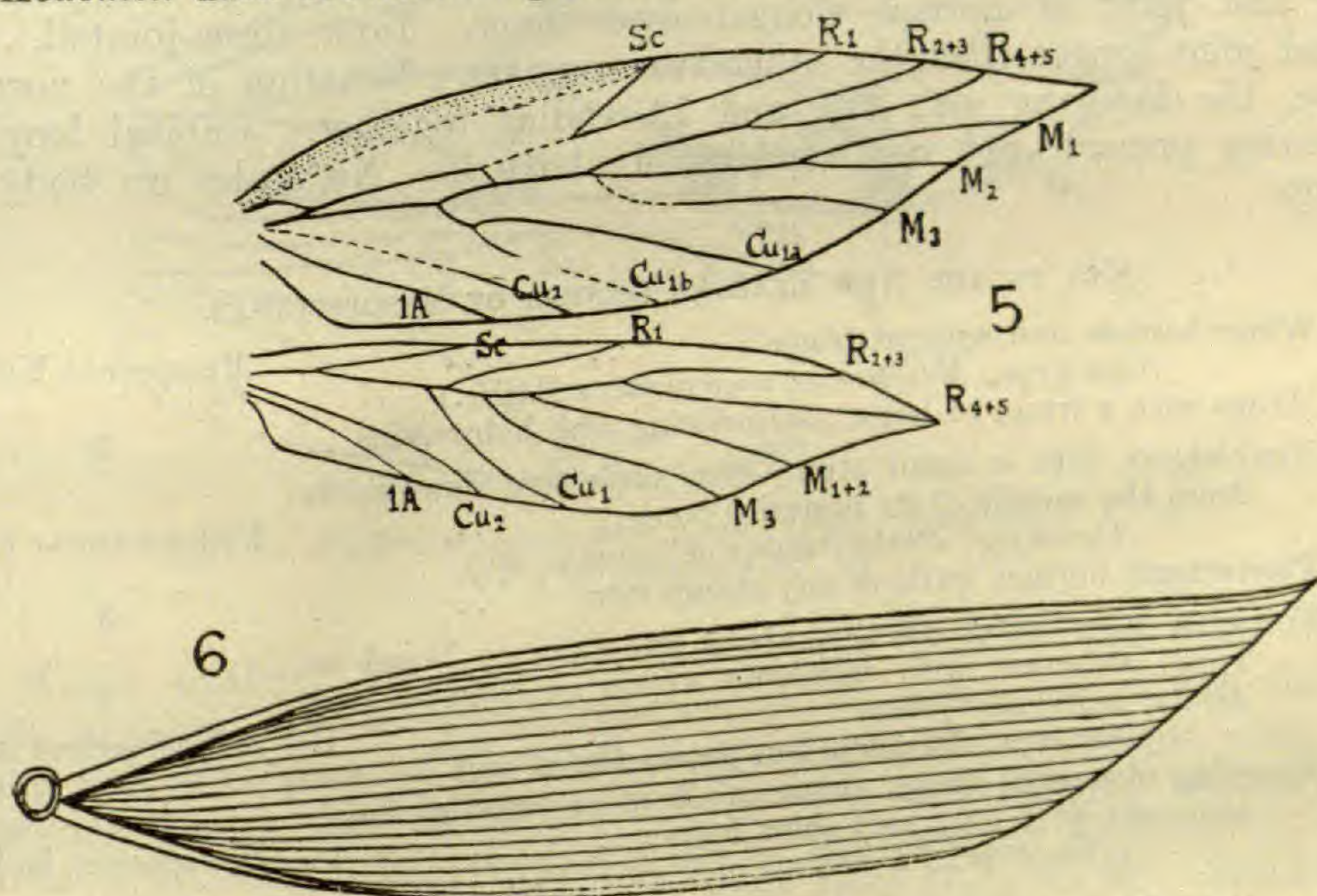


FIG. 5.—*Oxypsocus hamiltoni* n. g. et sp., type. Venation. $\times 25$. (For lettering see fig. 1.)

FIG. 6.—*Oxypsocus hamiltoni* n. g. et sp., type. A single scale from forewing. $\times 940$.

Wings: Forewings suffused with brown; hairs golden-brown, scales dark brown but paler near their bases. One of these scales is shown in text-fig. 6; it measures 0.12 mm. in length, and is of a peculiar cultriform shape, the sharply pointed apex being in line with one side of the scale, while the other side slopes off obliquely for the last quarter of its length; there are about 18 very distinct longitudinal striae, which remain well separated distally, but tend to run together towards the base; no cross-striation is present. Venation of forewing mostly pale and rather indistinct in places, but the main stem of $M + Cu_1$ is dark brown. Hind-wing hyaline, with dark-brown venation and greyish hairs on fringe.

Type.—Holotype in Cawthron Institute collection; also a paratype dissected and mounted on two slides, the wings separate from the rest. One set paratype in Dominion Museum collection, Wellington.

Habitat.—Masterton, N.Z. Taken by Mr. H. Hamilton, Zoologist to the Dominion Museum, Wellington, on the 28th March, 1921, while beating a bush of *Cyathodes acerosa*. The species is dedicated to its discoverer.

The finding of this remarkable archaic Psocopteron is a noteworthy event in New Zealand entomology. A species of *Echmepteryx* has been described from Western Australia, and a species of *Echinopsocus* from New Guinea; but this new genus is more archaic than either of these. It appears to occupy, within the order Psocoptera, a position closely analogous to that of the genus *Sabatinca* within the Lepidoptera, and there is also a close similarity in the venational type and in the structure of the scales. Parenthetically, it might be noted that these scales, if obtainable in sufficient numbers, would be of considerable value in testing the resolving-powers of lens-combinations for high magnifications.

Family MESOPSOCIDAE.

Antennae with 13 joints. Ocelli present. Maxillary palpi four-jointed, the last joint of normal elongate-oval shape. Tarsi three-jointed, the basal joint longer than the other two together. Venation of the normal type, the forewing with Cu_2 and 1A ending together. Cubital loop of forewing present, but not touching M above it. No scales on body or wings.

KEY TO THE NEW ZEALAND GENERA OF MESOPSOCIDAE.

- | | | | |
|---|---|--|-----------------------------|
| 1 | { | Wings hairless and without fringe | <i>Mesopsocus</i> Kolbe. |
| | | (Genotype, <i>Mesopsocus unipunctatus</i> Müller.) | |
| | | Wings with a fringe of hairs, the forewing with hairy veins .. | 2 |
| 2 | { | Pterostigma with a small stump-vein projecting downwards from the middle of its posterior border | <i>Philotarsopsis</i> n. g. |
| | | (Genotype, <i>Philotarsopsis delicatus</i> n. sp.) | |
| | | Pterostigma normal, without any stump-vein | 3 |
| 3 | { | Forewing very broad distally, about two-fifths as broad as long; antennae with numerous whorls of hairs as long as the individual joints | <i>Zelandopsocus</i> n. g. |
| | | (Genotype, <i>Zelandopsocus formosellus</i> n. sp.) | |
| | | Forewing of normal shape, about one-third as broad as long; antennae with only very short hairs | <i>Philotarsus</i> Kolbe. |
| | | (Genotype, <i>Philotarsus picicornis</i> [Fabr.].) | |

Genus PHILOTARSUS Kolbe.

Characters as given in the key above. The genus was separated from *Elipsocus* Hagen by Kolbe on the amount of fringe present in the hindwing. In *Philotarsus* the fringe of hairs is complete in this wing; in *Elipsocus* the hairs are confined to the margin around the apex. The genus is also closely allied to *Hemineura* Tetens, in which the hindwing possesses no fringe of hairs at all.

Genotype.—*Philotarsus picicornis* (Fabr.).

Two species of this genus have been described from Australia. The two known New Zealand species may be separated by the following key:—

- | | |
|---|-----------------------------|
| Insect of stout build, veins of the forewing strongly formed; Cu_2 of forewing hairy; stigma dark; middle part of forewing irregularly clouded | <i>Ph. guttatus</i> n. sp. |
| Insect of slenderer build, veins of the forewing not so stoutly built; Cu_2 of forewing without hairs; stigma pale in centre, with a dark patch at each end; little or no clouding in middle part of forewing | <i>Ph. maculatus</i> n. sp. |

***Philotarsus maculatus* n. sp.** (Plate 18, fig. 2; and text-fig. 7.)

Forewing, 3 mm.; expanse of wings, 6.7 mm.

Head cream-colour, heavily spotted with dark brown on epicranium, frons, and clypeus; clypeolus unspotted; labrum black. Eyes dark brown. Antennae pale greyish-brown, ringed with cream-colour at base. Maxillary palpi pale brown, distal joint black.

Thorax brown, the divisions of the mesonotum margined with cream-colour; antedorsum cream-colour with two dark spots. Legs pale greyish, brown with darker markings, the tarsi very dark brown.

Abdomen brown with cream-coloured markings.

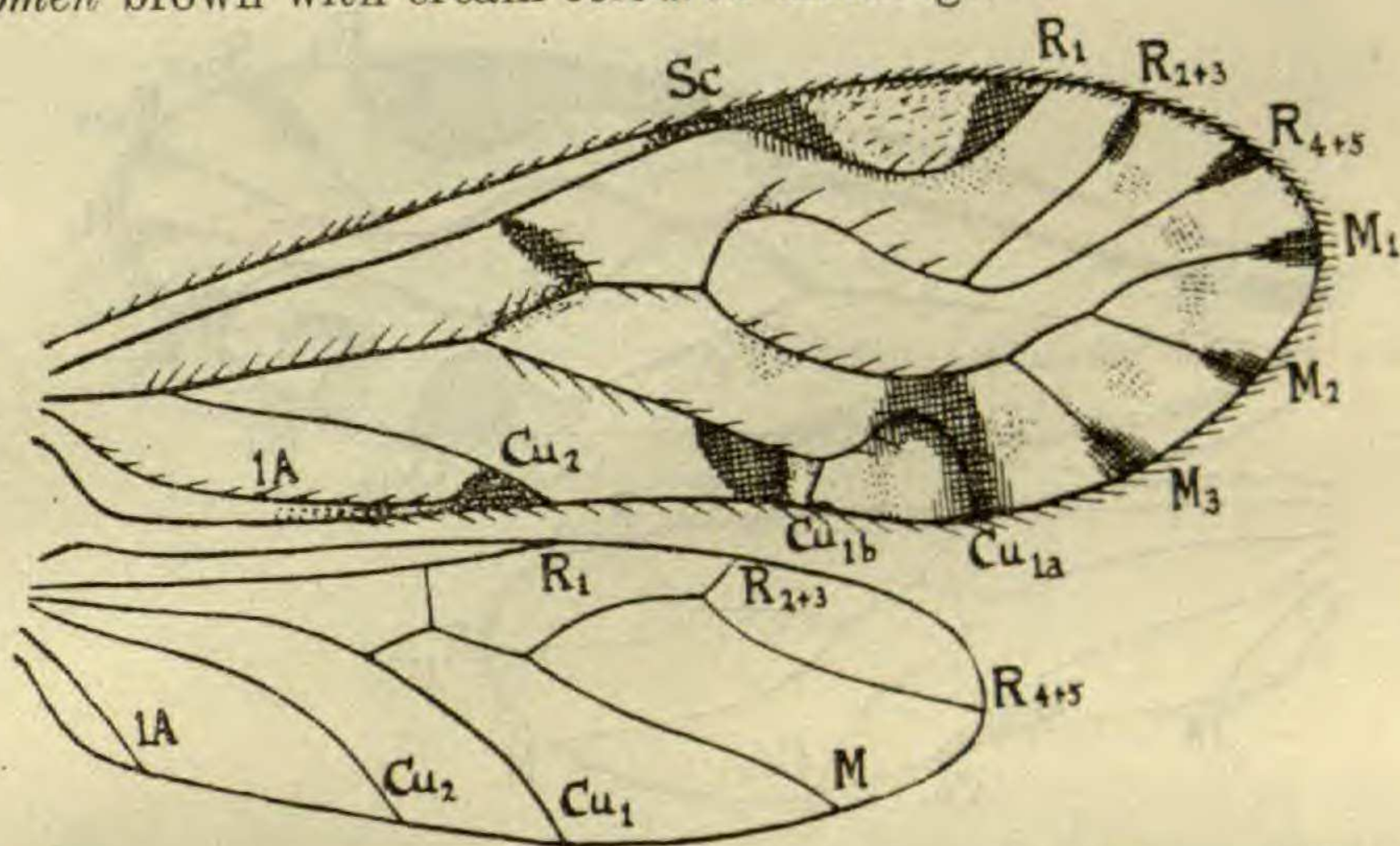


FIG. 7.—*Philotarsus maculatus* n. sp., type. Venation. $\times 24$.
(For lettering see fig. 1.)

Wings hyaline, the veins dark. Forewing marked with very dark spots at both ends of the pterostigma, at the distal end of the clavus, along the basal piece of Rs, along M just below it, between Cu₁ and the posterior margin just basad from Cu_{1b}, also more largely around the cubital loop, this patch extending up to the stem of M above it, and finally on the distal ends of all the veins from R₂₊₃ to M₃. Hindwing without any markings.

Habitat.—York Bay, Wellington Harbour, N.Z. A number were taken by me while sweeping the foliage of a young native beech (*Nothofagus Menziesii*) on the 20th March, 1921.

Type.—Holotype and series of paratypes in Cawthron Institute collection, Nelson.

***Philotarsus guttatus* n. sp.** (Text-fig. 8.)

Forewing, 3.2 mm.; expanse of wings, 7 mm.

Head.—Epicranium and frons dark brown, strongly granulated, and carrying golden-brown hairs. Antennae brown. Eyes dark brown. Clypeus brown, marked with numerous thick black striae carrying shallow pits. Clypeolus medium brown. Labrum blackish. Maxillary palpi pale brown, the distal joint blackish.

Thorax very dark brown, with golden-brown hairs. Legs brown, paler beneath.

Abdomen stout, dark brown.

Wings with very hairy margins and stout dark-brown veins; those of the forewing, including Cu₂, hairy, densely so on the basal half of the

wing. Pterostigma very hairy. Membrane of wing hyaline, blotched with dark brown as follows: On the forewing, two very dark blotches on pterostigma, one covering Sc, the other occupying most of the enlarged distal area; between them an area of paler brown, and another paler area completing the stigma distally. Irregular brown blotches also occupy the central portion of the forewing and surround the tips of the apical veins from R_{2+3} to M_3 . Distal two-thirds of cubital loop also filled with dark brown. In hindwing there is a patch of dark brown at distal end of clavus.

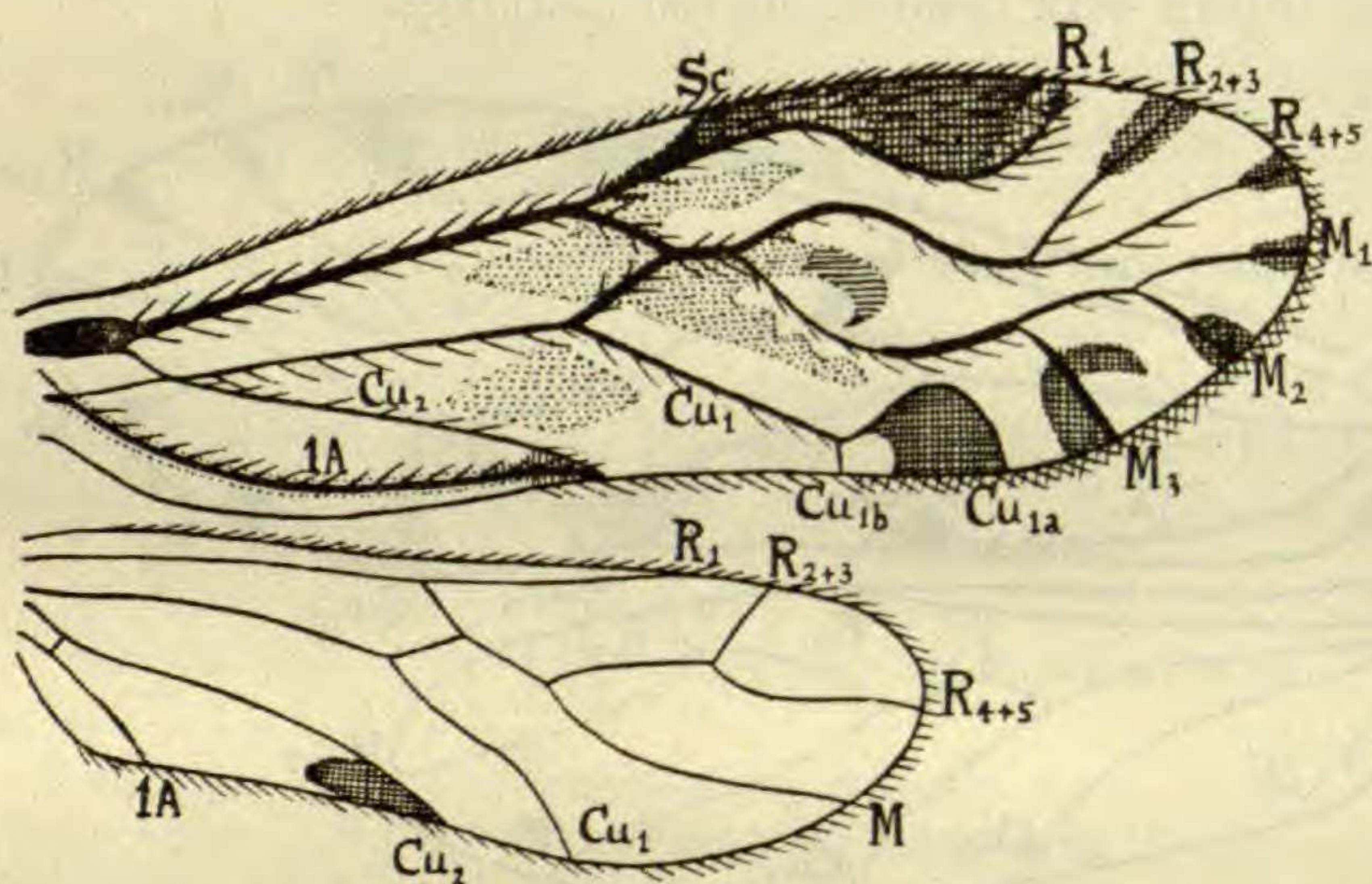


FIG. 8.—*Philotarsus guttatus* n. sp., type. Venation. $\times 24$.
(For lettering see fig. 1.)

Habitat.—Tisbury, near Invercargill, N.Z.; two specimens taken by Mr. A. Philpott in January, 1918. Masterton, N.Z.; one specimen taken by Mr. H. Hamilton, March, 1921.

Type.—Holotype (15th January, 1918) and paratype (18th January, 1918) from Tisbury, in Cawthron Institute collection, Nelson.

Genus PHILOTARSOPSIS n. g.

Characters as given in the key above. It is closely allied to *Philotarsus* Kolbe, but differs in possessing a stump-vein descending from the middle of the posterior border of the pterostigma in the forewing, and also in the narrower bases of both fore and hind wings. This genus resembles *Psilopsocus* End. in possessing the stump-vein, but differs from it in that *Psilopsocus* has absolutely hairless wings.

Genotype.—*Philotarsopsis delicatus* n. sp.

Habitat.—New Zealand only, so far as is known.

Philotarsopsis delicatus n. sp. (Text-fig. 9.)

Forewing, 3.8 mm.; expanse of wings, 8.2 mm.

Head yellowish-brown, marked with very dark brown as follows: On the epicranium, a central mark behind the ocelli in the form of two U's close together and inverted; depending from the inner margin of each eye, an inverted mark of interrogation; an oblique dark stripe running from each lateral ocellus to base of antenna on same side; on the frons, a blackish patch in front of the median ocellus. Antennae dark brown, the

two basal joints touched with paler brown. Eyes very dark brown, slightly mottled with medium brown. Ocelli large, black. Clypeus striated with dark brown or blackish, and carrying a few long slender pale hairs. Clypeolus pale brown. Labrum blackish. Maxillary palpi pale yellowish-brown, distal joint blackish.

Thorax very dark brown, touched with paler brown, and carrying long slender grey hairs. Legs dull-brownish.

Abdomen dark brown, with paler markings.

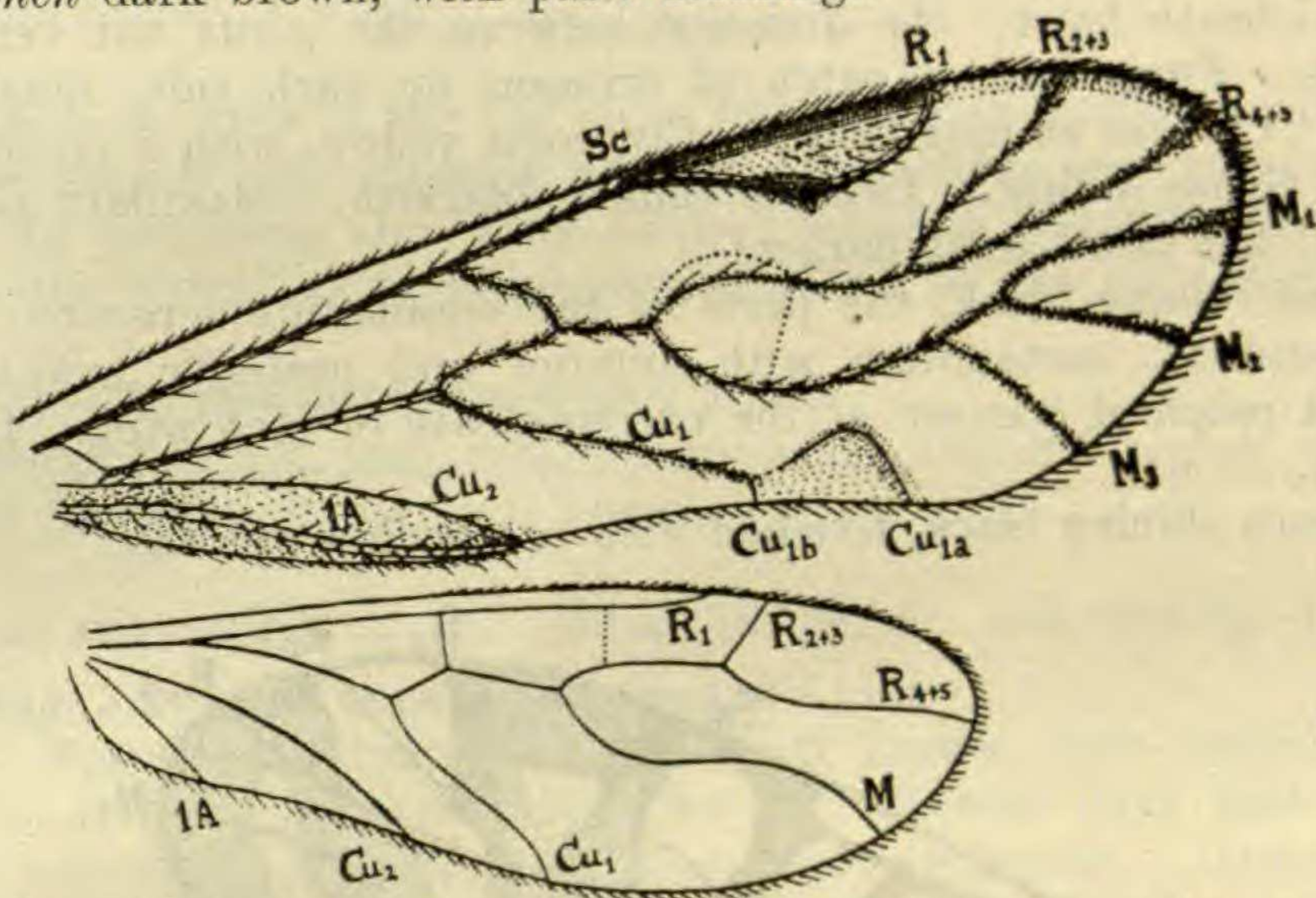


FIG. 9.—*Philotarsopsis delicatus* n. g. et sp. Venation. $\times 24$. (For lettering see fig. 1.) The dotted lines indicate abnormalities in the venation of the right side of the type; the normal venation, as shown on the left side of the type, has been restored in the figure.

Wings hyaline, the veins dark, except C, Sc+R, M+Cu, and 1A in the forewing, which are pale. All the veins of the distal half of the forewing slightly clouded with brown on the adjacent membrane, this clouding becoming wider distally. Pterostigma very hairy, dark brown along costa and around end of Sc; R_1 , forming the posterior border of the stigma, is very thick, dark brown and pale yellow alternately in four portions, the dark parts situated basally and before and up to the stump-vein, the yellow parts between these two and from stump-vein to apex of R_1 . Cubital loop and clavus of forewing also cloudy, the latter especially between 1A and the posterior margin. Hindwing without any markings.

Habitat.—Tisbury, near Invercargill, N.Z. A single specimen taken by Mr. A. Philpott, 30th December, 1917.

Type.—Holotype in Cawthron Institute collection, Nelson.

Genus ZELANDOPSOCUS n. g.

Characters as given in the key on p. 180. Closely allied to *Philotarsus* Kolbe, but differing from it in the very hairy antennae, the much greater distal breadth of the forewing, and consequently in the manner of folding the wings when at rest, the forewings being held almost vertically, inclined at a very narrow angle to one another. All the veins of the forewing are hairy except only Cu_2 .

Genotype.—*Zelandopsocus formosellus* n. sp.

Habitat.—New Zealand only, so far as is known.

Zelandopsocus formosellus n. sp. (Plate 18, fig. 3; and text-fig. 10.)

Forewing, 3 mm.; expanse of wings, 7 mm.

Head pale yellow, marked with crimson and brown. Epicranium yellow with two crimson patches, and carrying a few stiff black bristles. Eyes dull-brownish. Ocelli close together, rose-brown, the median one smaller than the other two. On either side, between lateral ocellus and eye, there is an irregular patch of crimson. Antennae with the two basal joints pale-yellowish, the rest yellowish-brown, furnished with numerous whorls of long delicate hairs; the divisions between the joints not very clearly indicated. Frons with a patch of crimson on each side, near base of antenna. Clypeus shining brown. Clypeolus yellow, with a median brown blotch. Genae yellow. Labrum shining blackish. Maxillary palpi dull-brownish, the distal joint darker.

Thorax shining black, the parts of the mesonotum separated by pale-yellow sutures; metanotum with anterior and posterior median yellow spots. A patch of crimson at the extreme base of each wing. Legs pale-brownish.

Abdomen shining black, touched with pale yellow apically.

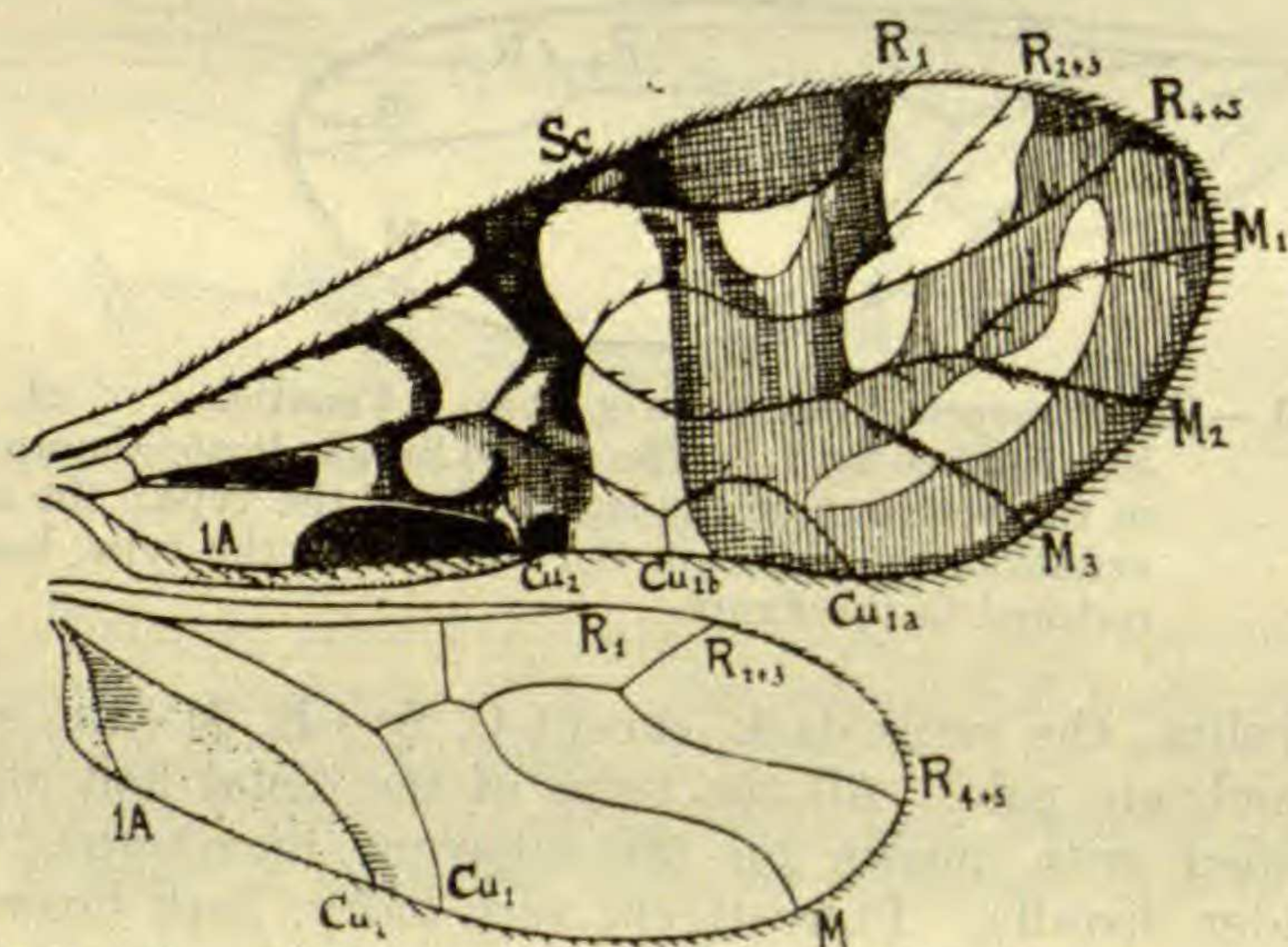


FIG. 10.—*Zelandopsocus formosellus* n. g. et sp. Venation. $\times 24$.
(For lettering see fig. 1.)

Wings hyaline, with pale venation. Forewing of normal width basally, but much broader from end of clavus distad; apex broadly rounded; this wing beautifully marked with rich brown and black as shown in text-fig. 10 and in Plate 18, fig. 3. Hindwing hyaline, the clavus suffused with brown.

Habitat.—New Zealand, many localities, but never very common. South Island: Waitati (Mr. W. G. Howes, 12th November, 1916); Tisbury, near Invercargill (Mr. A. Philpott, 4th January, 1918); Dun Mountain, Nelson, several specimens taken by Mr. Philpott and myself, December, 1920, to February, 1921; Tasman, several specimens taken by myself, 24th April, 1921. North Island: York Bay, Wellington Harbour, one specimen taken by myself, 20th March, 1921.

Type.—Holotype (Dun Mountain, 2,000 ft., 3rd February, taken by Mr. Philpott), also a number of paratypes, in Cawthron Institute collection.

This species was first discovered by Mr. W. G. Howes at Waitati in 1916. In order that the type specimens should as far as possible be capable

of being figured in Plate 18, I have selected a better-set specimen from the Dun Mountain as type. In the cases of the two preceding species no well-set specimens exist, and thus it was impossible to photograph them on the plate.

Zelandopsocus formosellus is not only the most beautiful of all the New Zealand Psocoptera, but is indeed one of the most beautiful species known for the whole order throughout the world.

Genus *MESOPSOCUS* n. g.

Characters as given in the key on p. 180, to which should be added that the cubital loop is very strongly arched, approaching very close to M at the top. In possessing absolutely hairless wings it resembles *Psilopsocus* End., but the latter has a stump-vein attached to the pterostigma as in *Philotarsopsis* n. g.

Genotype.—*Mesopsocus unipunctatus* Müller.

This genus has not been recorded from the Oriental region, nor does it occur in Australia, so far as is known.

Mesopsocus stigmaticus n. sp. (Plate 18, fig. 4; and text-fig. 11.)

Forewing, 3.5 mm.; expanse of wings, 7.5 mm.

Head: Epicranium, frons, and eyes dark brown, with irregular pale-ochreous markings. Antennae dark brown. Clypeus dark brown, with numerous pale-ochreous striae. Clypeolus pale ochreous. Labrum dark brown. Maxillary palpi brown, distal joint very dark brown.

Thorax dark brown, slightly marked with paler brown. Legs brown.

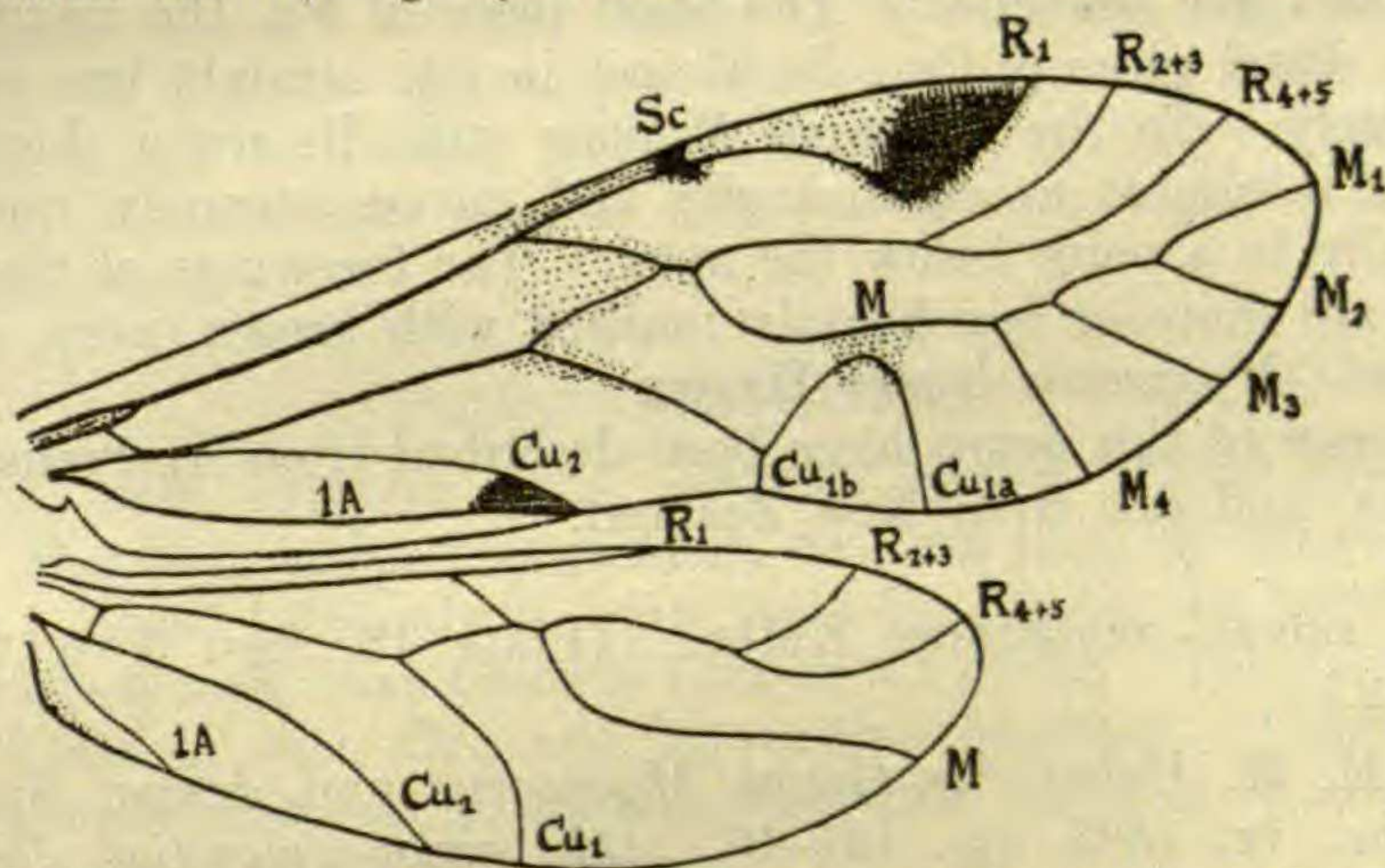


FIG. 11.—*Mesopsocus stigmaticus* n. sp. Venation. $\times 23$. (For lettering see fig. 1.) The right forewing of the type is aberrant, having four branches to M; the left forewing is normal, with three branches.

Abdomen dark brown.

Wings hyaline, with black veins. Forewing with a large irregular black spot filling up the distal convexity of the pterostigma and also reaching somewhat below R_1 ; the rest of the stigma slightly clouded; at its base a small black spot covering the end of Sc and projecting for a short distance obliquely below R_1 ; a dark cloud between Cu_2 and 1A at end of clavus; slight clouding around the basal portions of Rs, M, and Cu_1 , and also between M and the top of the cubital loop. Hindwing hyaline, without markings.

The right forewing of the type has four well-developed branches to M, while the left forewing is normal, with only three branches.

Habitat.—Dun Mountain, Nelson, 3,000 ft.; taken by Mr. A. Philpott on the 9th February, 1921. A single specimen only.

Type.—Holotype in Cawthron Institute collection.

Family MYOPSOCIDAE.

Antennae with 13 joints. Ocelli present. Maxillary palpi four-jointed, the last joint of normal elongate-oval shape. Tarsi three-jointed, the basal joint longer than the other two together. Venation of the normal type, the forewing with Cu_2 and 1A ending together. Cubital loop of forewing present, either just touching M or fusing with M for a short distance.

This family is divided into two subfamilies, as follows:—

Forewing with a cross-vein between pterostigma and Rs .. Subfamily PROPSOCINAE.
Forewing without a cross-vein between pterostigma and Rs Subfamily MYOPSOCINAE.

Only the latter subfamily occurs in New Zealand.

Subfamily MYOPSOCINAE.

Genus MYOPSOCUS Hagen.

In this genus the median vein is much zigzagged in both wings. In the forewing M runs obliquely upwards to meet Rs, then bends sharply downwards, at right angles to its former course, until it reaches the top of the cubital loop, when it again bends obliquely upwards and runs to the apex, dividing into three branches. The basal piece of Rs, the middle piece of M, and the distal piece of Cu_{1a} lie almost in one straight line crossing the wing obliquely. In the hindwing M fuses with Rs for a short distance, then leaves it almost at right angles and curves strongly round to run longitudinally to a point below the apex. The forewings of the species of this genus are more or less heavily marked with brown, grey, or fuscous.

Genotype.—*Myopsocus lugens* Hagen.

Two species of this genus have been described from Australia, one from New Guinea, and one from New Zealand.

Myopsocus novae-zealandiae Kolbe. (Plate 18, figs. 5, 6; and text-fig. 2.)

Kolbe, H. J., Ueber das Genus *Myopsocus* und dessen Species, *Ent. Nachr.*, ix, 1883, pp. 141–46. (*M. novae-zealandiae* described on p. 145, loc. Wellington.)

Psocus zelandicus Hudson, 1892, *Man. N.Z. Ent.*, p. 107, and pl. xvi, fig. 2, 2a (larva). *Myopsocus novae-zealandiae* Kolbe, Hutton, 1899, *Trans. N.Z. Inst.*, vol. 31, p. 211 (mentions that the types of this species were sent by Hutton to McLachlan in 1873).

Forewing—male, 4–4.5 mm.; female, 5–5.5 mm. Expanse of wings—male, 9–10 mm.; female, 11.5–12.5 mm.

This species has already been well described by Kolbe and Hutton. It is very much larger than any other known New Zealand Psocopteron, and can be at once recognized by the dark forewings, mottled brown or fuscous, as shown in Plate 18, figs. 5, 6. Points that should be noted are the following: The males are much smaller and darker in colour than the

females. When the forewings are fuscous the pterostigma remains brown, and so shows up very clearly, especially in the males. This brown colour really overlaps the actual pterostigmatic area, as shown in text-fig. 2, where the boundary of the brown colour is shown by the dotted line, lying outside the greatly bent posterior border of the stigma. In the forewing, vein Sc remains separate from R_1 , running close above it up to the base of the stigma. In the hindwing, Sc is vestigial. In the forewings of most specimens M just touches Rs at one point and the top of the cubital loop at another; occasionally one may find a specimen in which contact just fails in one or both cases, and sometimes there is fusion for a very short distance. The basal tarsal joint is very long, and carries along its inferior border a complicated comb (text-fig. 2, *b*) formed from about 30 closely set teeth, each tooth being of the form shown in text-fig. 2, *c*. The second tarsal joint is exceedingly short, the third about twice as long as the second.

Habitat.—All parts of New Zealand; frequently very common. Near Hamilton I found many colonies of the larvae, at the end of March, 1921, clustering under the dry bark of large trees of kahikatea (white-pine). They were easily reared by keeping them on pieces of bark in dry tubes closed with cotton-wool. It is very interesting to watch both larvae and imagines feeding on the dry bark by gouging it out with their maxillary chisels, which can be seen at work, projecting far beyond the mouth.

The types of this insect are probably in the McLachlan collection at Lewisham, near London, though I cannot be certain on this point. The New Zealand species is so closely allied to *M. australis* Br., common in many parts of Australia and Tasmania, that it is a matter of great difficulty to separate the two. *M. australis* is generally browner in colour, and in most specimens shows a definite fusion of M with Rs and also with the cubital loop for a short distance, in the forewing. In both species the male carries a pair of hooked terminal appendages, those of *M. australis* appearing to be somewhat shorter and less sharply pointed than in the New Zealand species.

Family CAECILIIDAE.

Antennae rather stoutly built, with 13 joints. Ocelli present, close together. Maxillary palpi four-jointed, the last joint of normal elongate-oval shape. Tarsi with only 2 joints (text-fig. 13, *b*), the basal being the longer, and often more than twice as long as the distal. Venation of normal type, the forewing with Cu_2 and 1A ending together. Cubital loop of forewing either absent, or, if present, then not touching M above it, and not connected with M in any manner.

This family, which is abundantly represented in most parts of the earth, is usually divided into numerous subfamilies, only two of which are to be found in New Zealand. These may be separated as follows:—

Cubital loop of forewing present	..	..	..	Subfamily CAECILIINAE.
Cubital loop of forewing absent	..	..	..	Subfamily PERIPSOCINAE.

Subfamily CAECILIINAE.

To the characters given above should be added the following: Pterostigma not connected with Rs by a cross-vein, but either entirely free or at most with a stump-vein depending from its posterior border. Rs and M in forewing fused together for a short distance, as also in hindwing.

Both the New Zealand genera have a complete fringe of hairs on both wings, and the veins of the forewing are hairy. They may be distinguished as follows:—

Cubital loop moderately to very slightly arched; its top not approaching at all near to M; posterior border of pterostigma normally waved	<i>Caecilius</i> Curtis.
Cubital loop very strongly arched, the distance between its top and M above it being much less than the height of the loop; posterior border of pterostigma sharply angulated towards its distal end	<i>Maoripsocus</i> n. g.

(Genotype, *Maoripsocus semifuscatus* n. sp.)

Genus CAECILIUS Curtis.

Characters as given in the above key.

This genus is practically world-wide in distribution, and contains a very large number of described species, including four from New Guinea and three from Australia. Four new species are here described from New Zealand. They may be separated by the following key:—

1	Forewing narrow, less than one-third as broad as long, pterostigma very flat, only one-seventh as broad as long; colour pale creamy, semi-transparent	<i>C. zelandicus</i> n. sp.
	Forewing broader, a little more than one-third as broad as long; pterostigma with posterior border normally curved; colour pale semi-transparent brown or yellowish	2
2	Veins of forewing with a double set of longish hairs; colour pale semi-transparent brownish	3
	Veins of forewing with only a single set of short hairs; all distal veins and outer margin of clavus infusate; pterostigma pale yellow	<i>C. flavistigma</i> n. sp.
3	Forewing with dark spots at ends of all veins except only Cu_{1b}	<i>C. apicipunctatus</i> n. sp.
	No such spots present; size much smaller than above; the forewings uniformly pale semi-transparent brown	<i>C. brunellus</i> n. sp.

Caecilius zelandicus n. sp. (Plate 18, fig. 7; and text-fig. 12.)

Forewing, 2.9 mm.; expanse of wings, 6.1 mm.

Head entirely pale testaceous, except eyes, which are black; antennae testaceous.

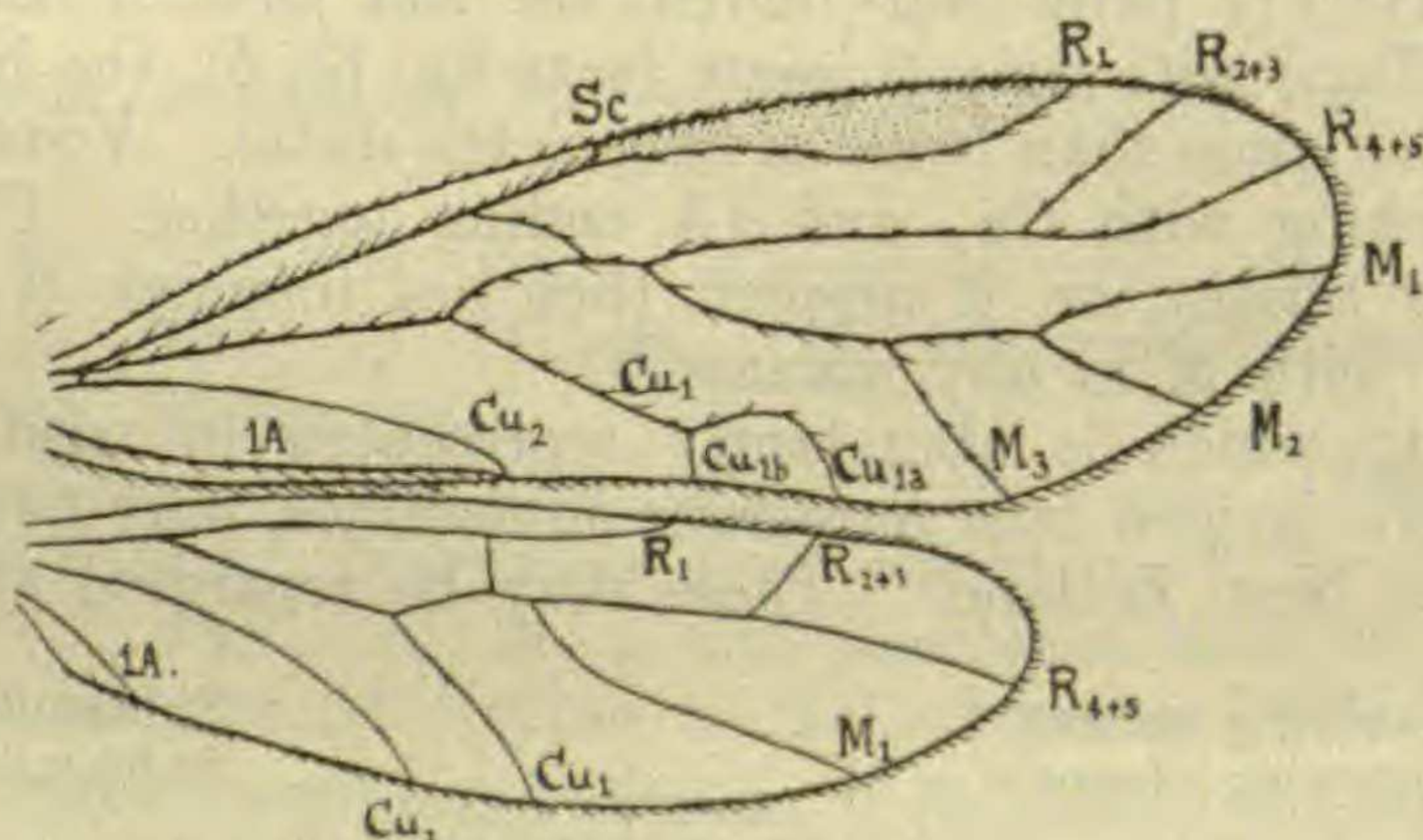


FIG. 12.—*Caecilius zelandicus* n. sp., type. Venation. $\times 24$.
(For lettering see fig. 1.)

Thorax and legs testaceous.

Abdomen testaceous.

Wings: Veins testaceous, those of forewing carrying only a single set of very short hairs. Forewing narrow, less than one-third as broad as long,

semi-transparent cream-colour; pterostigma granulate, very flat, only one-seventh as broad as long. Hindwing hyaline.

Habitat.—Common in native bush in most parts of New Zealand.

Type.—Holotype in Cawthron Institute collection (Nelson, 13th April, 1921, R. J. Tillyard).

Caecilius flavistigma n. sp. (Plate 18, fig. 8; and text-fig. 13.)

Forewing, 3.1 mm.; expanse of wings, 6.5 mm.

Head entirely testaceous, except the eyes and the ocellar tubercle, which are black. Ocelli small, testaceous, placed very close together. Antennae brownish at base, shading to testaceous distally.

Thorax testaceous, the four divisions of the mesothorax dark brown. Legs testaceous.

Abdomen testaceous, marked with lemon-yellow.

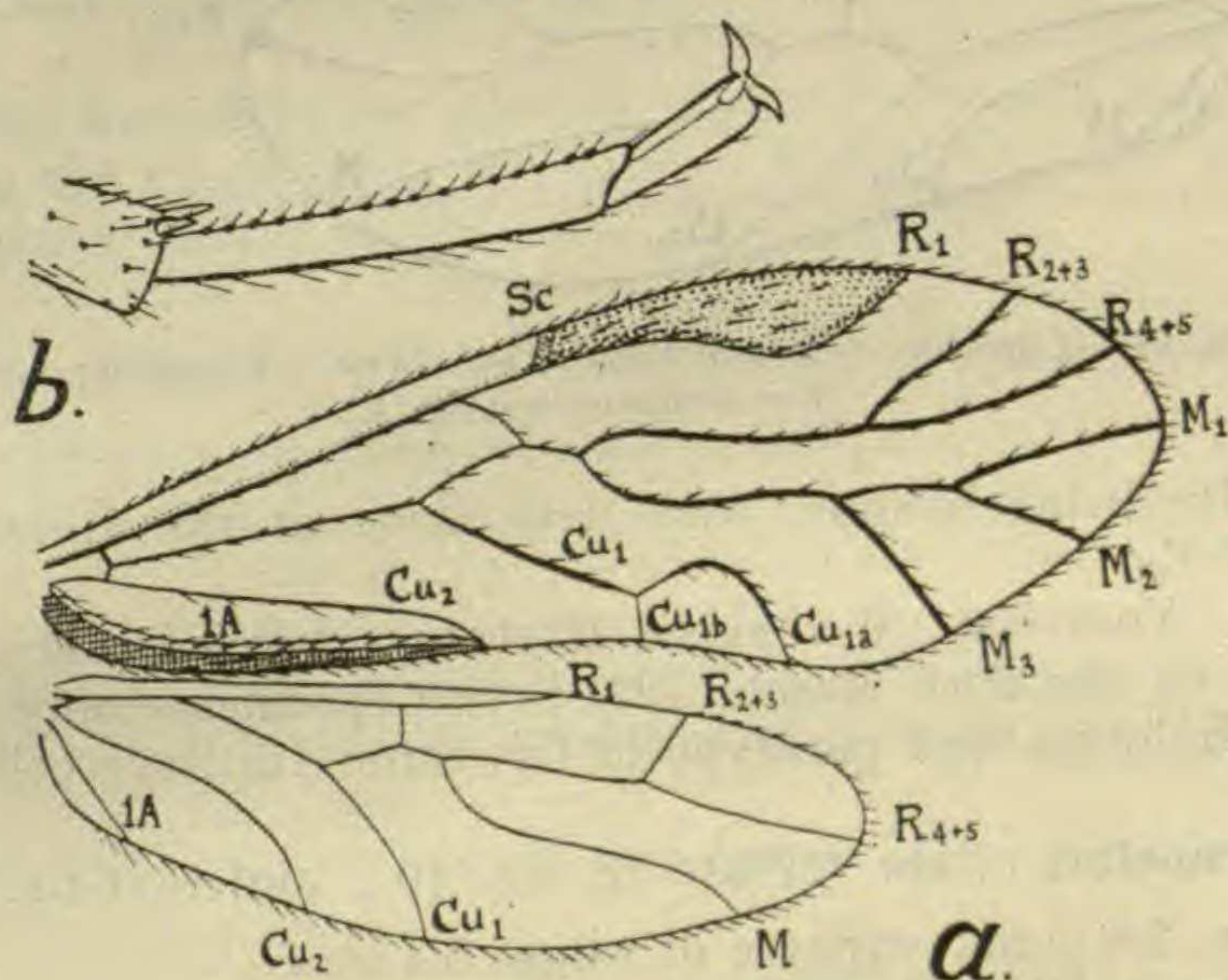


FIG. 13.—a. *Caecilius flavistigma* n. sp., type. Venation. $\times 24$.
(For lettering see fig. 1.) b. Two-jointed hind tarsus of same. $\times 45$.

Wings: Forewing a little more than one-third as broad as long. Veins pale near base, but becoming darker distally; all the veins of the distal half of the wing strongly infuscated; membrane semi-transparent yellowish-brown; pterostigma of normal shape, about one-fifth as broad as long, pale lemon-yellow in colour; the narrow area between 1A and the posterior border fuscous. Hindwing hyaline.

Habitat.—Nelson, common throughout the summer months, both in native bush and in orchards; Hamilton, one specimen, 28th March, 1921.

Type.—Holotype and series of paratypes in Cawthron Institute collection (Nelson, 13th April, 1921, R. J. Tillyard).

Caecilius apicipunctatus n. sp. (Plate 18, fig. 9; and text-fig. 14.)

Forewing, 3.2 mm.; expanse of wings, 6.6 mm.

Head, thorax, and abdomen entirely testaceous. Eyes and ocelli brownish. Antennae with long, slender hairs. Legs testaceous.

Wings: Forewing a little more than one-third as broad as long. Veins testaceous, those of forewing with a double set of long hairs, except Cu₂,

which is hairless. Membrane of forewing suffused with pale semi-transparent brown, and with dark spots present at the apices of all the veins except Cu_{1b} , and also at the origins of R_s and M_3 . Pterostigma granulate, hairy

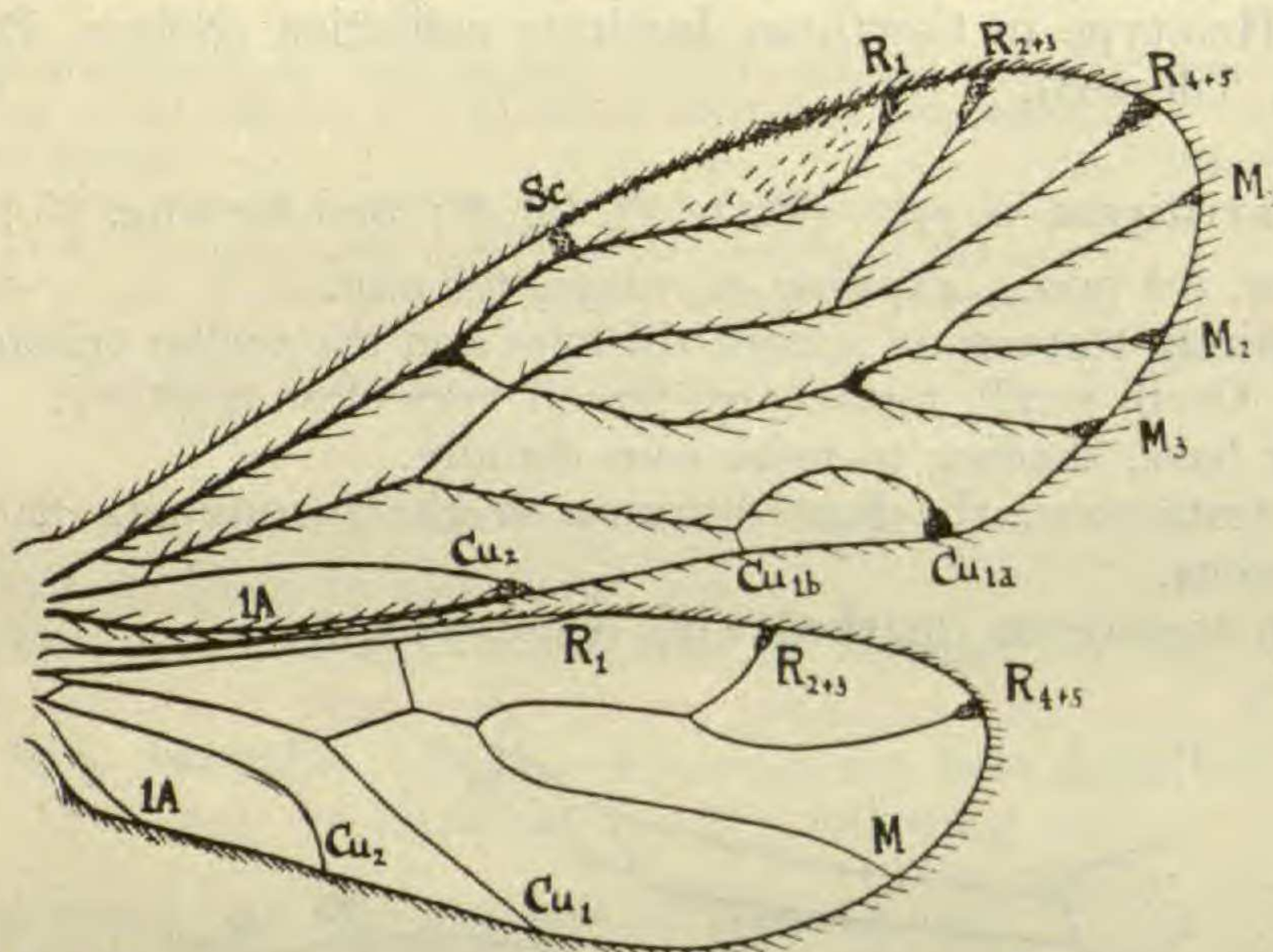


FIG. 14.—*Caecilius apicipunctatus* n. sp., type. Venation. $\times 27$.
(For lettering see fig. 1.)

distally. Hindwing hyaline, with dark spots at the apices of the two branches of R_s .

Habitat.—York Bay, Wellington Harbour; taken by Mr. J. G. Myers and myself on the 20th March, 1921; two specimens only.

Type.—Holotype and paratype in Cawthron Institute collection.

Caecilius brunellus n. sp. (Plate 18, fig. 10; and text-fig. 15.)

Forewing, 2.6 mm.; expanse of wings, 5.4 mm.

Head, thorax, and abdomen entirely brownish testaceous. Ocelli darker brown. Eyes black and very prominent. Antennae very hairy. Legs brownish testaceous.

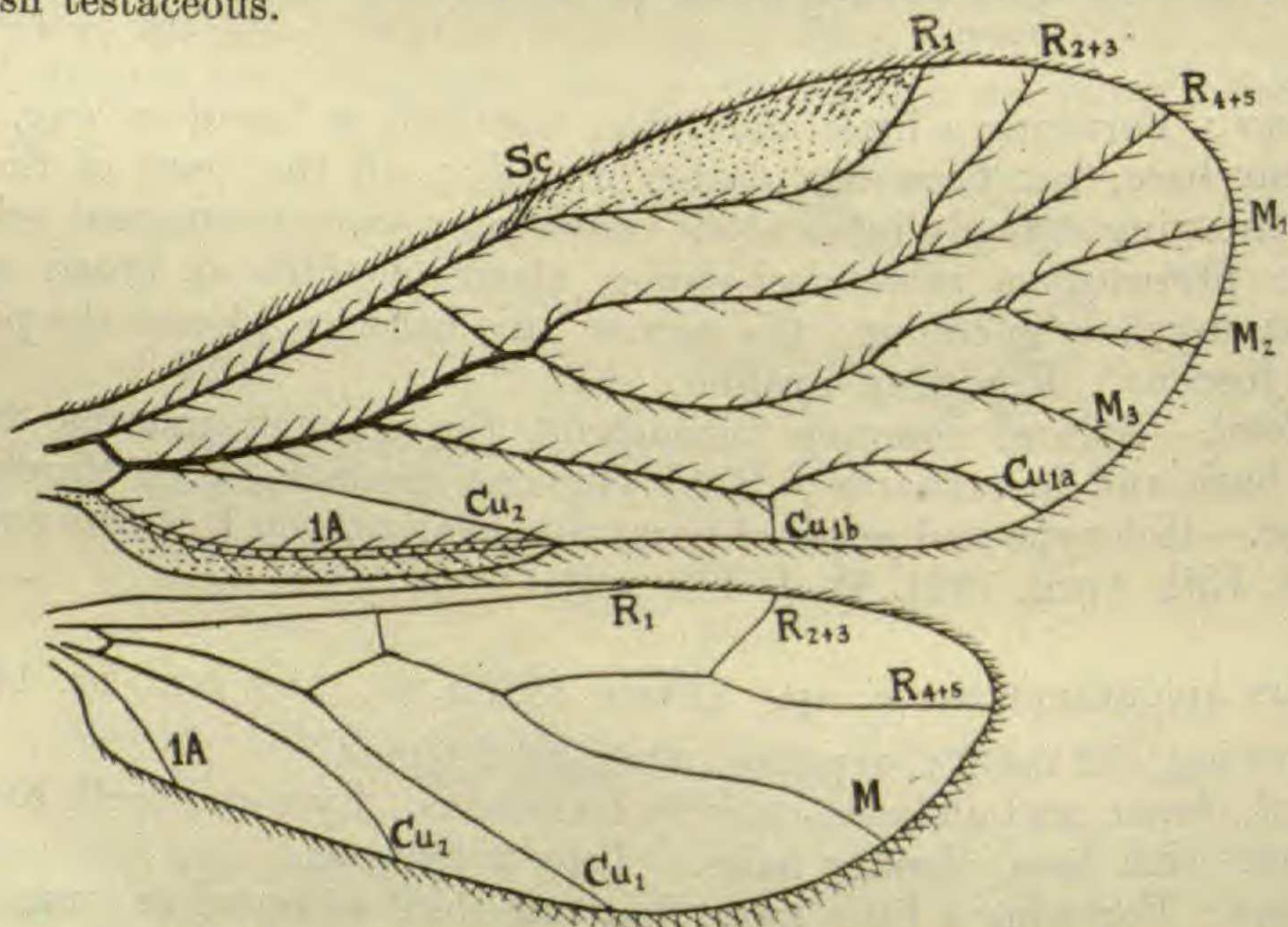


FIG. 15.—*Caecilius brunellus* n. sp., type. Venation. $\times 38$.
(For lettering see fig. 1.)

Wings: Forewing about two-fifths as broad as long; all the veins except Cu_2 with a double set of very long hairs; veins testaceous; membrane suffused with pale semi-transparent brown; pterostigma weakly granulate, very long (nearly one-third of entire wing-length), with numerous minute hairs along costal margin; no spots on wing. Hindwing hyaline.

Habitat.—Hamilton, N.Z. A number of specimens taken by myself while sweeping *Pittosporum* and kahikatea (white-pine), 28th March, 1921.

Type.—Holotype and series of paratypes in Cawthron Institute collection.

Genus MAORIPSOCUS n. g.

Characters as given in the key on p. 188.

Genotype.—*Maoripsocus semifuscatus* n. sp.

Habitat.—New Zealand only, so far as is known.

This genus is closely related to *Kolbea* Bertkau from Ceylon and Singapore, but differs from it in the strongly angulated shape of the pterostigma and in having the wings much less hairy. *Kolbea* also has a partial series of hairs developed distally on the veins of the hindwing.

Maoripsocus semifuscatus n. sp. (Plate 18, fig. 11; and text-fig. 16.)

Forewing, 2.8 mm.; expanse of wings, 6 mm.

Head: Epicranium dark brown; two pale-yellowish patches interior to eyes and a pale ill-defined band behind ocelli isolate a large circular blotch of the ground-colour in the middle. Antennae and eyes dark brown. Ocelli small, placed close together on a prominent black tubercle. Frons and clypeus dark brown. Labrum black, with pale upper margin. *Maxillary palpi* pale-brownish.

Thorax blackish, with very short pale-brown hairs. Legs brown.

Abdomen very dark brown.

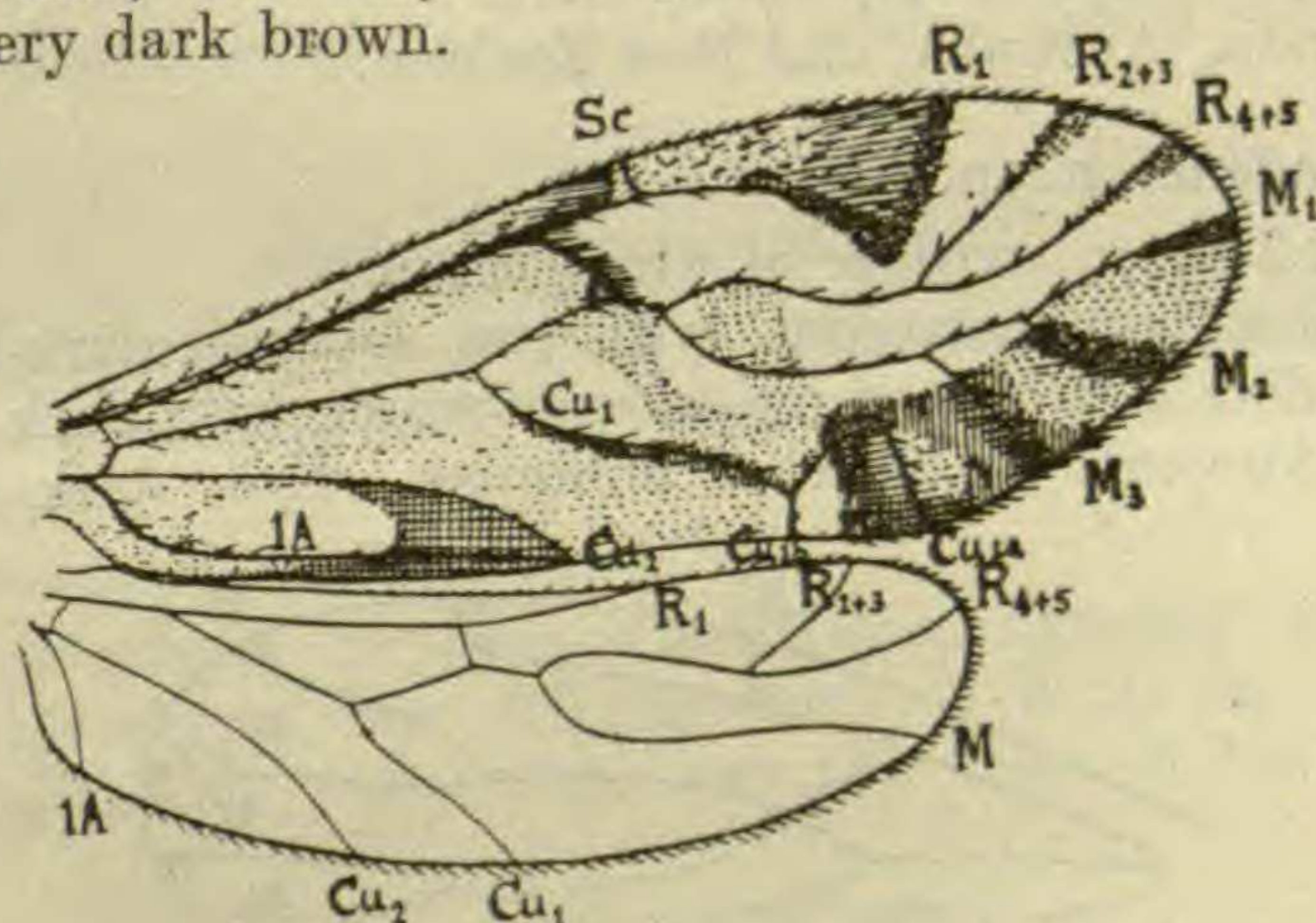


FIG. 16.—*Maoripsocus semifuscatus* n. g. et sp., type. Venation. $\times 24$.
(For lettering see fig. 1.)

Wings: Forewings irregularly blotched with various shades of fuscous, as shown in Plate 18, fig. 11, and text-fig. 16. Pterostigma very hairy, a nearly black blotch placed basad from the basal side (Sc), which itself carries a pale-brownish spot; distal half of stigma covered with a very dark blotch which reaches down beyond the prominent angle of the posterior margin towards Rs. Other dark blotches are situated at end of clavus, in the angle between Rs and M where they meet, on the cubital loop,

and the distal ends of the branches of M. The rest of the wing is partially shaded and partially hyaline, as indicated in the figures. Hindwing hyaline, without markings.

Habitat.—Hamilton; three specimens taken by myself while sweeping kahikatea (white-pine) on the 28th March, 1921. Nelson; one specimen taken by Mr. Philpott on the 2nd February, 1921.

Type.—Holotype and two paratypes (Hamilton) in Cawthron Institute collection.

Subfamily PERIPSOCINAE.

To the characters given on p. 187 should be added the following: Pterostigma not connected with R by a cross-vein. Rs and M in forewing either meeting at a point or fusing for a short distance.

The genera of this subfamily found in New Zealand may be at once recognized by the complete absence of the cubital loop in the forewing. Only two such genera are at present known, and these may be separated by means of the following key:—

- Rs and M fused for a short distance in both wings; pterostigma of normal shape, with the posterior margin waved *Peripsocopsis* n. g.
(Genotype, *Peripsocopsis maoricus* n. sp.)
- Rs and M meeting at one point only in forewing, and connected by a cross-vein in hindwing; pterostigma subrectangular, with the posterior margin straight *Ectopsocus* McLachlan.

Genus ECTOPSOCUS McLachlan.

Characters as given in the above key, with the addition that the wings are without a fringe of hairs, the veins of the forewing either quite hairless or with only a few very minute hairs along some of them, and the wing-membrane is minutely punctate all over.

Genotype.—*Ectopsocus briggsi* McLachlan.

Habitat.—India, Australia, and New Zealand.

Ectopsocus congener n. sp.

Forewing, 2.3 mm.; expanse of wings, 5 mm.

Head: Epicranium testaceous, with two squarish dark-brown patches close up to median suture, and irregular mottling with dark brown around the eyes and forwards to bases of antennae. Eyes dark brown. Ocelli

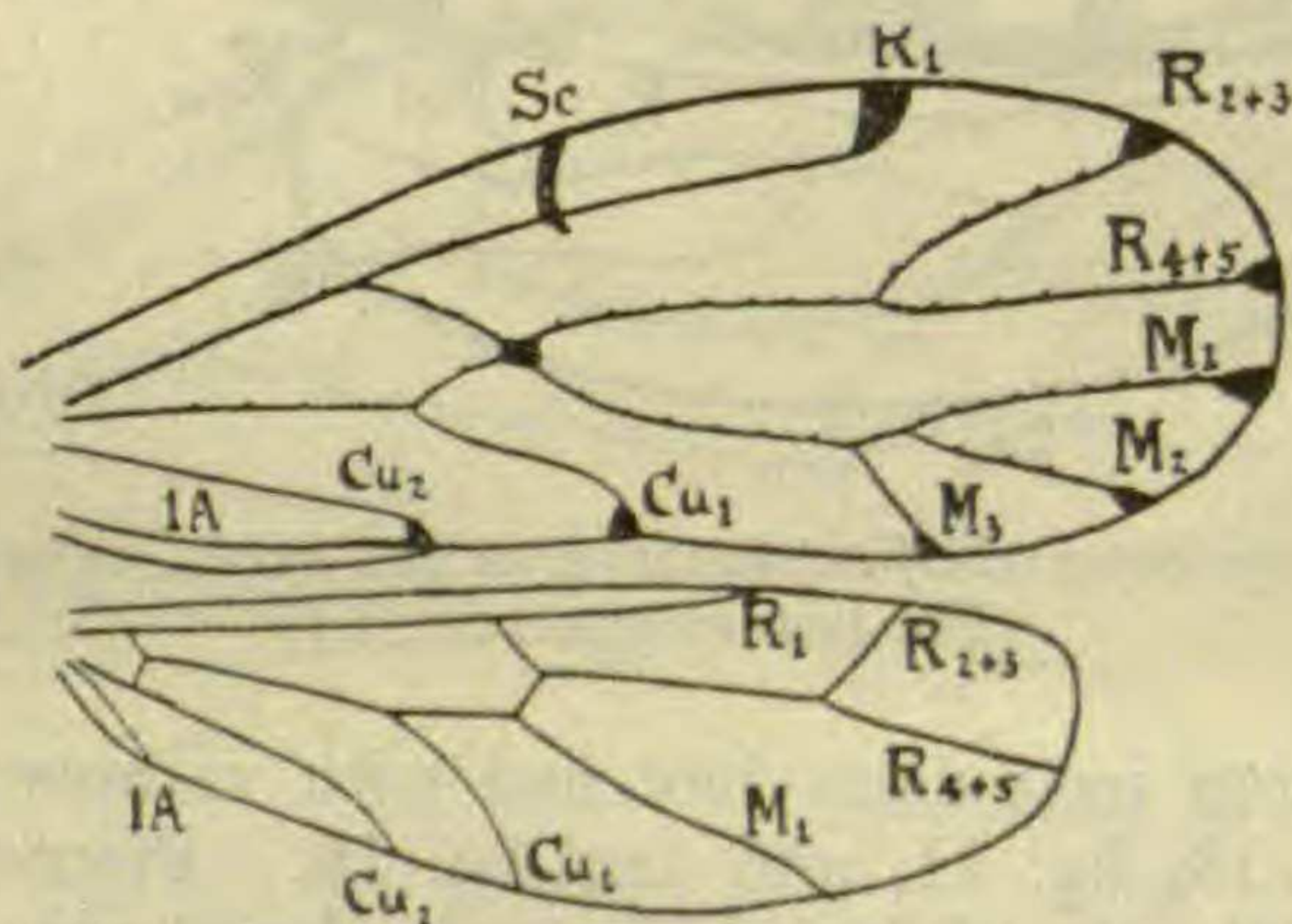


FIG. 17.—*Ectopsocus congener* n. sp., type. Venation. $\times 18$.
(For lettering see fig. 1.)

large, ruby-coloured, bordered with dark brown. Antennae dark brown, stout, with numerous short hairs. Frons fulvous, with pale hairs. Clypeus rich brown, with short pale hairs. Labrum very dark brown. Maxillary palpi brown.